

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application: Claims 1-65 are pending. Claims 1-39 have been withdrawn.

**Listing of Claims:**

1.-39. (Cancelled)

40. (Original) A graded core/shell semiconductor nanorod comprising:

at least a first segment comprising:

a core comprising a Group II-VI, Group III-V or a Group IV semiconductor,

a graded shell overlying the core,

wherein the graded shell comprises at least two monolayers,

wherein the at least two monolayers each independently comprise a Group II-VI, Group III-V or a Group IV semiconductor.

41. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

the graded shell has at least three monolayers, and

the monolayer closest to the core comprises a first semiconductor material, and

the outermost monolayer comprises a second semiconductor material, wherein

between the monolayer closest to the core and the outermost monolayer there exists a concentration gradient of the first and second semiconductor material.

42. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

the number of monolayers is between two and eight.

43. (Original) The graded core/shell semiconductor nanorod of claim 42, wherein:

the number of monolayer is between 2 and 6.

44. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

there is a tail extending longitudinally from the core.

45. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:  
the core comprises CdSe and the graded core/shell comprises CdS/ZnS.
46. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:  
there is joined to the first segment a second segment comprising:  
a core comprising a Group II-VI, Group III-V or a Group IV semiconductor,  
a graded shell overlying the core,  
wherein the graded shell comprises at least two monolayers,  
wherein the at least two monolayers each independently comprise a Group II-VI, Group III-V or a Group IV semiconductor.
47. (Original) The graded core/shell semiconductor nanorod of claim 46, wherein:  
the second segment core comprises CdSe and the second segment graded shell monolayers comprise, in order, CdS/ZnS.
48. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:  
the first and the second segments have different cross sectional areas.
49. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:  
there is a third segment joined to the second segment.
50. (Original) The graded core/shell semiconductor nanorod of claim 49, wherein:  
the first, second and third segments have different cross sectional areas.
51. (Currently Amended) A nanorod barcode, comprising:  
a first linear segment of a first material; and  
a second linear segment of a second material joined longitudinally to said first segment;  
wherein at least one of the first and second segments is configured to generate emission in response to excitation energy.

52. (Original) The nanorod barcode of claim 51, wherein:

said first and second segments comprise a nanorod core, and  
said first and second segment cores independently comprise either a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors or a metal selected from the group consisting of transition metals, oxides and nitrides thereof.

53. (Original) The nanorod barcode of claim 52, wherein:

said first and second segment cores independently comprise a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

54. (Original) The nanorod barcode of claim 52, wherein:

said first segment core comprises a metal selected from the group consisting of transition metals, oxides and nitrides thereof, and  
said second segment comprises a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

55. (Original) The nanorod barcode of claim 52, further comprising:

a third segment connected longitudinally to said first segment core, and  
said third segment core comprising a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

56. (Original) The nanorod barcode of claim 55, wherein:

said second and third segments have different cross sectional areas.

57. (Original) The nanorod barcode of claim 55, wherein:

said first segment core comprises Co, and said second and third segment cores comprise CdSe.

58. (Original) The nanorod barcode of claim 53, wherein:

said first and second segments have different cross sectional areas.

59. (Original) The nanorod barcode of claim 58, wherein:

at least one of said first and second segment cores have a graded shell overlying the core.

60. (Original) The nanorod barcode of claim 58, wherein:

both segment cores have a graded shell overlying said cores.

61. (Original) The nanorod barcode of claim 53, wherein:

there is a third segment joined longitudinally to said second segment, and

said third segment comprises a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

62. (Original) The nanorod barcode of claim 61, wherein:

at least one of said first and second and third segment cores have a graded shell overlying the core.

63. (Original) The nanorod barcode of claim 62, wherein:

all segment cores have a graded shell overlying the cores.

64. (Original) The nanorod barcode of claim 55, wherein:

said first, second and third segments have different cross sectional areas.

65. (Original) A method of using a nanorod barcode to identify an element, comprising:

labeling at least one identifiable element with at least one nanorod barcode as claimed in claim 51.